

**DETAILED ACTION**

***Election/Restrictions***

1. This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

The species are as follows:

Species 1 (claims 1-8) drawn to a first fuel cell assembly.

Species 2 (claims 9-14) drawn to a second fuel cell assembly.

Species 3 (claims 15-18) drawn to a third fuel cell assembly.

Applicant is required, in reply to this action, to elect a single species to which the claims shall be restricted if no generic claim is finally held to be allowable. The reply must also identify the claims readable on the elected species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered non-responsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

2. The claims are deemed to correspond to the species listed above in the following manner:

Species 1 – claims 1-8

Species 2—claims 9-14

Species 3 – claims 15-18

The following claim(s) are generic: None.

3. The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons: Species 1's special technical feature lies (a) in the channels in the distribution foil extend from a first edge to a second edge and (b) in the presence of the cover foil extends over the distribution to enclose the distribution foil channels. Species 2's special technical feature lies (a) in the fact that the channels of the distribution foil extend from either a first edge or proximal position to a second edge or proximal position and (b) that the cover foil is co-extensive with a substantial part of the distribution foil to enclose a part of the length of the distribution foil channels. Species 3's special technical feature lies (a) in the fact that the channels of the distribution foil extend from either a first edge or proximal position to a second edge or proximal position and (b) in the placement of the distribution membrane (between an MEA and fluid flow plate). Since all the species, as listed above have the special technical feature as identified, wherein the specified special technical feature of each species is different, the species are seen to be distinct.

4. During a telephone conversation with Paul Pysher on February 3, 2009 a provisional election was made with traverse to prosecute the invention of Species 1, claims 1-8. Affirmation of this election must be made by applicant in replying to this Office action. Claims 9-18 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

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5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Preliminary Amendment***

6. The preliminary amendment received January 7, 2005 has been acknowledged.

***Priority***

7. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

8. The disclosure is objected to because of the following informalities: the first paragraph does not mention the continuing data (and there is no application data sheet that mentions such information).

***Information Disclosure Statement***

9. The information disclosure statements filed January 5, 2005, February 16, 2005, and March 11, 2009 have been placed in the application file and the information referred to therein has been considered as to the merits.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which

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applicant regards as the invention. Claim 1 recites the phrase "the channels terminating at the second edge point at positions substantially coincident with respective ones of the field plate channels" (lines 6-7). However, it is unclear as to what "ones" refers to (an edge of the fluid flow plate, a terminal point of a fluid flow plate, or channels of the fluid flow plate). Accordingly, such language is seen to be indefinite.

11. Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: a fuel cell. (It is noted that a "fuel cell assembly" is claimed within the preamble, but the body of the claim does not require a fuel cell. Accordingly, any flow plate would read on the claim, as long as it is a structure which is capable of being used in a fuel cell.)

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 1, 2, and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6066408 (Vitale et al.) in view of US 6303245 (Nelson).

As to claim 1, Vitale et al. al teach of a fuel cell assembly (fig. 1; col. 1, lines 8-12). There is a fluid flow plate (for example cathode plate [216]). Furthermore, there is a distribution foil (cooler-humidifier plate [202]) wherein with a plurality of channels (fig. 3). (It is noted that the lands [304] and island lands [306] are taken to from a plurality of channels within channel [218]. Additionally, it is noted that although not depicted, that one embodiment includes a plurality of channels (col. 7, lines 59-63). As seen in fig. 2C, portions of the channel of cooler-humidifier plate [202] extends through the plate, constituting a first edge (see bridge passage [224], as interpreted with respect to the portion facing the fuel cell plate [204],) and a second edge (with respect to the humidification side [214]) (for example depicted by the gas outlet [226] portion on the humidification side, as connected to the fuel cell plate [204] facing portion via channels [218] and bride passage [224]) (fig. 2C, fig. 3). It can be seen in fig. 2C that the

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channels of the cooler-humidifier plate [202] are coincident with those of the cathode flow plate [216]. The embodied material for the cooler-humidifier plate [202] is stainless steel (thus qualifying it to be considered a foil) (col. 6; lines 33-35). It is noted that the cathode plate [216] is seen to be a cover extending over the distribution foil (humidifier plate [202] to enclose the channels and form conduits for water between the them, as Vitale et al. teach that plate [216] serves the purpose of closing open-face flow channels [218] of the cooler-humidifier plate [202], wherein the wick of the coolant-humidifier plate [202] provides water to the reactant gas (col. 6, lines 44-46; col. 7, lines 64-65; fig. 3).

Vitale et al. does not specifically teach that the cover (cathode plate [216]) is a foil (the material used for the anode/cathode plates).

However, Nelson teaches that anode and cathode plates are typically metal (thus qualifying such plates to be a foil) (col. 1, lines 45-47). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a metal material (foil) for the cathode plate of Vitale et al. since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

As to claim 2, Vitale et al.'s gas inlet [314] and water inlet [210] constitute a first series of channels extending to the first edge of the foil (side that faces the anode plate [204] in fig. 2C; fig. 3). Channel [218] with the lands [304] and island lands [306] constitute an array of channels in communication with the first series of channels, forming a pressure distribution gallery, as such a depicted channel keeps pressure differential low (col. 8, lines 44-49). A second series of channels [226] extends to the

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second edge of the foil (humidification side [214]) (fig. 2C; fig. 3). (It is noted that the claim language is seen as not requiring a plurality of channels for each series, as within independent claim 1, only a plurality of channels is required, wherein "of channels" is seen to refer back to the plurality of channels in claim 1, wherein only a plurality of channels must exist. Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Also, limitations appearing in the specification but not recited in the claim are not read into the claim. See *In re Zletz*, 893F.2d 319, 321-22, 13 USPQ2d, 1320, 1322 (Fed. Cir. 1989). However, it is noted that an alternate rejection is made, wherein each series must have a plurality of channels. See portion denoted by "\*" below.)

As to claim 6, the distribution foil channels [218] of Vitale et al. can be said to terminate at a first edge (side facing anode plate [204]) of the foil (plate [202]) at a supply manifold (holes [258] that deliver humidified cathode gas manifold [256]), as the manifold [258] and terminal point of foil channels (portion of [226] facing anode plate [204]) are in line with one another.

As to claim 7, Vitale et al. embody using stainless steel for the cooler-humidifier plate [202] is stainless steel (col. 6; lines 33-35).

As to claim 8, although Vitale et al. does not teach the method of which the distribution foil channels [218] are made, such a limitation is seen to be a product-by-process limitation, wherein the structure of Vitale et al. is the same as the claimed invention.

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. “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re Thorpe, 777 F.2d, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)(citations omitted).

“The Patent Office bears a lesser burden of proof in making out a case of prima facie obviousness for product-by-process claims because of their peculiar nature” than when a product is claimed in the conventional fashion. In re Fessmann, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). See MPEP section 2113.

13. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vitale et al. and Nelson, as applied to claim 1, in further view of US 5998054 (Jones et al.).

\*Alternately, as to claim 2, Vitale et al.’s gas inlet [314] and water inlet [210] constitute a first series of channels extending to the first edge of the foil (side that faces the anode plate [204] in fig. 2C; fig. 3). Channel [218] with the lands [304] and island



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lands [306] constitute an array of channels in communication with the first series of channels, forming a pressure distribution gallery, as such a depicted channel keeps pressure differential low (col. 8, lines 44-49). A second series having a channel [226] extends to the second edge of the foil (humidification side [214]) (fig. 2C; fig. 3).

Vitale et al. does not teach that the second series has channels.

However, Jones et al. teach that each fluid flow plate (bipolar plate) has a plurality of inlets/flow channels [126] and an equal amount of channels for water injection [131] (fig. 2; fig. 3). The motivation for employing such a system (multiple flow channels and a corresponding number of injection ports for water inlet) is that such a system would allow easier mixing and uniform distribution of water over the volume of the fuel cell assembly (col. 3, lines 5-13; 26-34). Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to have multiple inlet channels, wherein there is a channel for humidity that corresponds to each (as taught by Jones et al. and applied to Vitale et al.), in order to have a fuel cell system wherein the water introduced to the reactant flow can be more uniformly mixed and distributed through the cell.

As to claim 3, Vitale et al. teach that the channel [226] terminates at a second edge (humidification side of cooler-humidifier plate [202]). As seen in fig. 2C, this can be seen to be a convergence structure, as it focuses water flow into a channel in the fluid flow plate of fluid flow (as humid air exits through outlet [226]) (col. 7, lines 26-30).

Vitale et al. do not teach a plurality of convergence structures (corresponding with a respective channel).

However, Jones et al. teach that each fluid flow plate (bipolar plate) has a plurality of inlets/flow channels [126] and an equal amount of channels for water injection [131] (fig. 2; fig. 3). The motivation for employing such a system (multiple flow channels and a corresponding number of injection ports for water inlet) is that such a system would allow easier mixing and uniform distribution of water over the volume of the fuel cell assembly (col. 3, lines 5-13; 26-34). Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to have multiple inlet channels, wherein there is a channel for humidity that corresponds to each (as taught by Jones et al. and applied to Vitale et al.), in order to have a fuel cell system wherein the water introduced to the reactant flow can be more uniformly mixed and distributed through the cell.

As to claim 4, Vitale et al.'s convergence structure (gas outlet [226]) shows a recess on the second edge (side [214] of plate [202]) of the distribution foil (plate [202]), as gas outlet [226] is cut out (fig. 3).

As to claim 5, Vitale et al.'s cut out (gas outlet [226]) can be considered to be arcuate, as at least one portion of the cut out is curved.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EUGENIA WANG whose telephone number is (571)272-4942. The examiner can normally be reached on 7 - 4:30 Mon. - Thurs., EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/E. W./

Examiner, Art Unit 1795

/PATRICK RYAN/

Supervisory Patent Examiner, Art Unit 1795